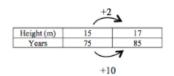
Unit Rates and Proportions

Example 1: Sam paid \$4.95 for $\frac{3}{4}$ pound of his favorite trail-mix. What is the unit price (dollars per pound)?

Solution: The unit price is $\frac{\$4.95}{\frac{3}{4}$ pound . To create a unit rate we need a denomintor of "one."

$$\frac{\$4.95\frac{4}{3}}{\frac{3}{4} \text{ pound} \cdot \frac{4}{3}} = \frac{\$4.95\frac{4}{3}}{1 \text{ pound}} = \$4.95 \cdot \frac{4}{3} = \$6.60$$

Example 2: Based on the table, what is the unit growth rate (meters per year)?



1 meter

$$\frac{2 \text{ meters}}{10 \text{ years}} = \frac{2 \text{ meters} + 10}{10 \text{ years} + 10} = \frac{\frac{1}{5} \text{ meter}}{1 \text{ year}} = \frac{1}{5} \frac{\text{meter}}{\text{year}}$$

Note: This same information could be determined by looking at a graph.

Example 3: In line at the movies are 146 people in front of you. If you count 9 tickets sold in 70 seconds, how long will it take before you buy your ticket?

Solution:

Solution: The information may be organized in a proportion $\frac{9 \text{ lickets}}{70 \text{ seconds}} = \frac{146 \text{ lickets}}{x}$. Solving the proportion $\frac{9}{70} = \frac{146}{x}$ yields 9x = 10220, so $x \approx 1135.56$ seconds or ≈ 19 minutes.

Solve the following problems on a separate piece of paper. You may use a calculator, but show all work.

- 12. The tax on a \$400 painting is \$34. What should be the tax on a \$700 painting.
- Use the table at right to write and solve a ratio for how long it will take Isadora to earn \$120.

\$ Earned	35	52.50	105
Days Worked	4	6	12

- 14. While baking, Hannah discovered a recipe for cookies that required $\frac{3}{4}$ cups of sugar for every $2\frac{1}{4}$ cups of flour. How many cups of sugar will she need for 4 cups of flour?
- 15. My brother grew $1\frac{3}{4}$ inches in $2\frac{1}{2}$ months. If he continues to grow at the same rate, how much should he grow in one year?
- 16. On his afternoon jog Chris took 42 minutes to run $3\frac{3}{4}$ miles. How many miles can he run in 90 minutes?
- 17. If Caitlin needs $1\frac{7}{8}$ cans of paint for each room in her house, how many cans of paint will she need to paint the 9-room house?
- 18. Stephen receives 6 gumballs for every two hours of homework he does. If he wants 22 gumballs, how many hours will he need to work?